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| Notice of Allowability | Application No. | Applicant(s) | |
| | 09/988,625 | JACKSON, DONALD S. | |
| | Examiner | Art Unit | |
| | Michael J Kyle | 3676 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on February 13, 2004.
2. ☒ The allowed claim(s) is/are 1,4,6-9,12 and 14-16.
3. ☒ The drawings filed on 20 November 2001 and 06 March 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date <u>05142004</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Ryan Stockett on May 14, 2004.

3. The application has been amended as follows:

Claims 1 and 7 have been amended. Claims 5 and 13 have been canceled.

1. (Currently Amended) A seal for a hydraulic cylinder rod, comprising:
a main body defining an opening therein and including an inner surface, an outer surface, a first radial face having a generally planar surface extending from the inner surface to the outer surface, a second radial face extending from the inner surface to the outer surface and having a groove disposed therein, the groove defining an inner lip adjacent the inner surface and an outer lip adjacent the outer surface; and

a plurality of relief features disposed in the outer surface of the main body, each of the plurality of relief features including a channel formed in the outer surface and extending from the first radial face to a recess having a width larger than a width of the channel and being disposed in the outer lip of the main body, wherein a ridge separates the recess from the second radial face, the recess of each of the plurality of relief features is adapted to receive a pressurized fluid from the first radial face through the channel, and the outer lip of the main body is adapted to flex to allow a flow of pressurized fluid from the first radial face

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to the second radial face when the pressure of the fluid at the first radial face is greater than the pressure of a fluid at the second radial face.

2. (Canceled)

3. (Canceled)

4. (Previously Presented) The seal of claim 1, further including a second channel extending along the first radial face and connecting with said channel in the outer surface.

5. (Canceled)

6. (Original) The seal of claim 1, wherein the main body has a substantially circular shape.

7. (Currently Amended) A hydraulic cylinder assembly, comprising:

a housing defining at least one chamber configured to hold a pressurized fluid, the housing having a head defining an opening;

a cylinder rod having a surface and disposed for sliding movement in the opening of the housing; and

a seal having a main body defining an opening configured to receive the cylinder rod therein, the main body including an inner surface, an outer surface, a first radial face having a generally planar surface extending from the inner surface to the outer surface, a second radial face extending from the inner surface to the outer surface and having a groove disposed therein, the groove defining an inner lip adjacent the inner surface and an outer lip adjacent the outer surface, the inner lip configured to engage the surface of

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the cylinder rod, the main body further including a plurality of relief features disposed in the outer surface of the main body, each of the plurality of relief features including a channel formed in the outer surface and extending from the first radial face to a recess having a circular shape with a diameter greater than a width of the channel and being disposed in the outer lip of the main body, wherein a ridge separates the recess from the second radial face, the recess of each of the plurality of relief features is adapted to receive a pressurized fluid from the first radial face through the channel, and the outer lip of the main body is adapted to flex to allow a flow of pressurized fluid from the first radial face to the second radial face when the pressure of the fluid at the first radial face is greater than the pressure of a fluid at the second radial face.

8. (Previously Presented) The hydraulic cylinder assembly of claim 7, further including a second seal configured to engage the surface of the cylinder rod between the at least one chamber and the inner lip of said first seal and a third seal configured to engage the surface of the cylinder rod at a location where both the first and second seals engage the surface of the cylinder rod between the at least one chamber and the third seal.

9. (Original) The hydraulic cylinder assembly of claim 8, wherein the housing includes a first annular groove configured to receive the first seal, a second annular groove configured to receive the second seal, and a third annular groove configured to receive the third seal.

10. (Cancelled)

11. (Cancelled)

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12. (Previously Presented) The hydraulic cylinder assembly of claim 7, further including a second channel extending along the first radial face and connecting with said channel in the outer surface.

13. (Canceled)

14. (Original) The hydraulic cylinder assembly of claim 7, wherein the main body has a substantially circular shape.

15. (Original) The hydraulic cylinder assembly of claim 8, wherein the second seal is a buffer seal.

16. (Original) The hydraulic cylinder assembly of claim 8, wherein the third seal is a wiper seal.

Marked up version showing changes made to the claims

1. (Currently Amended) A seal for a hydraulic cylinder rod, comprising:
a main body defining an opening therein and including an inner surface, an outer surface, a first radial face having a generally planar surface extending from the inner surface to the outer surface, a second radial face extending from the inner surface to the outer surface and having a groove disposed therein, the groove defining an inner lip adjacent the inner surface and an outer lip adjacent the outer surface; and

a plurality relief features disposed in the outer surface of the main body, each of the plurality of relief features including a channel formed in the outer surface and extending from the first radial face to a recess having a width larger than a width of the channel and being

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disposed in the outer lip of the main body, wherein a ridge separates the recess from the second radial face, the recess of each of the plurality of relief features is adapted to receive a pressurized fluid from the first radial face through the channel, and the outer lip of the main body is adapted to flex to allow a flow of pressurized fluid from the first radial face to the second radial face when the pressure of the fluid at the first radial face is greater than the pressure of a fluid at the second radial face.

2. (Canceled)

3. (Canceled)

4. (Previously Presented) The seal of claim 1, further including a second channel extending along the first radial face and connecting with said channel in the outer surface.

5. (Canceled)

6. (Original) The seal of claim 1, wherein the main body has a substantially circular shape.

7. (Currently Amended) A hydraulic cylinder assembly, comprising:

a housing defining at least one chamber configured to hold a pressurized fluid, the housing having a head defining an opening;

a cylinder rod having a surface and disposed for sliding movement in the opening of the housing; and

a seal having a main body defining an opening configured to receive the cylinder rod therein, the main body including an inner surface, an outer surface, a first radial face having a generally planar surface extending from the inner surface to the outer surface,

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a second radial face extending from the inner surface to the outer surface and having a groove disposed therein, the groove defining an inner lip adjacent the inner surface and an outer lip adjacent the outer surface, the inner lip configured to engage the surface of the cylinder rod, the main body further including a plurality of relief features disposed in the outer surface of the main body, each of the plurality of relief features including a channel formed in the outer surface and extending from the first radial face to a recess having a circular shape with a diameter greater than a width of the channel and being disposed in the outer lip of the main body, wherein a ridge separates the recess from the second radial face, the recess of each of the plurality of relief features is adapted to receive a pressurized fluid from the first radial face through the channel, and the outer lip of the main body is adapted to flex to allow a flow of pressurized fluid from the first radial face to the second radial face when the pressure of the fluid at the first radial face is greater than the pressure of a fluid at the second radial face.

8. (Previously Presented) The hydraulic cylinder assembly of claim 7, further including a second seal configured to engage the surface of the cylinder rod between the at least one chamber and the inner lip of said first seal and a third seal configured to engage the surface of the cylinder rod at a location where both the first and second seals engage the surface of the cylinder rod between the at least one chamber and the third seal.

9. (Original) The hydraulic cylinder assembly of claim 8, wherein the housing includes a first annular groove configured to receive the first seal, a second annular groove configured to receive the second seal, and a third annular groove configured to

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receive the third seal.

10. (Cancelled)

11. (Cancelled)

12. (Previously Presented) The hydraulic cylinder assembly of claim 7, further including a second channel extending along the first radial face and connecting with said channel in the outer surface.

13. (Canceled)

14. (Original) The hydraulic cylinder assembly of claim 7, wherein the main body has a substantially circular shape.

15. (Original) The hydraulic cylinder assembly of claim 8, wherein the second seal is a buffer seal.

16. (Original) The hydraulic cylinder assembly of claim 8, wherein the third seal is a wiper seal.

Allowable Subject Matter

4. The following is an examiner's statement of reasons for allowance: Seals for cylinder rods having a main body with an inner surface, outer surface, and first and second radial faces are known (Albertson). It is also known to include a plurality of relief features in the outer surface of the seal, where the relief feature comprises a channel and a recess (Albertson). Furthermore, the prior art shows a relief feature comprising where the recess has a larger width than the channel (Oliver). However, the prior art does not show a plurality of relief features, where each relief feature includes a channel and a recess having a width larger than the width of

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the channel. Oliver shows only a single recess with a width larger than that of the channels. The recesses of Albertson have the same width as the channels.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Kyle whose telephone number is 703-305-3614. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Shackelford can be reached on 703-308-2978. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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